

DOCUMENT RESUME

ED 246 396

CS 007 690

AUTHOR Bradtmueller, Weldon G.
TITLE Perception of the Use of High Technology in the Teaching of Reading: Microcomputer Use in Teaching Reading.
PUB DATE [83]
NOTE 15p.
PUB TYPE Information Analyses (070) -- Viewpoints (120)
EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS *Computer Assisted Instruction; *Computer Software; *Educational Opportunities; Educational Technology; Elementary Secondary Education; *Microcomputers; *Problems; *Reading Instruction; Reading Skills

ABSTRACT

The past few years have seen a proliferation of microcomputers and a reduction in their cost. Many children have microcomputers in their homes and have learned their use in playing games and solving problems. Among these programs are those designed to improve reading skills, many of which are somewhat poorly conceived and prepared, often being merely workbook pages transferred to the computer for presentation. Nevertheless, the computer can be used to improve or aid in reading instruction by offering a multimodal means of involving children in the learning process or by making possible the individualization of instruction. Other advantages of the computer are its ability to give immediate feedback to students and to encourage student creativity. Most students respond positively to using a computer as a learning device, but not all students profit from this experience. Among the limitations associated with microcomputers are the following: (1) different computers and programs require different procedures and are not compatible from one computer to another; (2) good programs are scarce and teachers are inexperienced in using the computer; (3) the computer keyboard limits eye-hand coordination; (4) the computer screen causes considerable eye strain and may also lessen the attention span of the child; and (5) many software programs lack clear goals and objectives. (HOD)

* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *

X This document has been reproduced as received from the person or organization originating it.
 Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official NIE position or policy.

Perception of the Use of High Technology in the Teaching of Reading

Microcomputer Use in Teaching Reading

Computer Assisted Instruction, often referred to by the acronym CAI, or CMI has been talked about, tried out and experimented with since the middle 1960's. These early uses of the computer as an instructional device, utilized main frame computers with fixed terminals. Many valuable experimental programs were developed that provided much needed data. The results indicated that computer could indeed be used as instructional devices and often seemed to have a motivational appeal for children who like to use machine-like devices in learning.

The widespread use of computers for instructional purposes has seemed impractical because of the expense involved. But the advent of the microcomputer and the great reduction in cost has made their use in present day classrooms a distinct possibility.

During the last five years there has been a continuing proliferation of microcomputers and reduction in cost. Many children have microcomputers in their homes and have learned their use in playing games, and solving problems.

At present many programs for learning various subjects are coming on the market. Included in these many programs are also programs designed to improve reading skills. Some of these are well written and carefully prepared programs that are good

"PERMISSION TO REPRODUCE THIS
MATERIAL HAS BEEN GRANTED BY

Weldon G. Bradtmueller

ED246396

05007690

instructional devices. Most are relatively poorly conceived and prepared. In fact, they are often merely workbook pages transferred to the computer for presentation.

The use of computers in the teaching of reading takes two major forms: computer-managed instruction (CMI) and computer-assisted instruction (CAI). Computer-managed instruction involves only the teacher using a computer to keep records of students and possibly aid in determining further program modifications.²⁰ On the other hand computer-assisted instruction involves the students actually using the computer in the teaching-learning situation.

Computer-assisted instruction usually falls into three classifications:²

1. Drill and practice type programs.
2. Dialogue or inquiry type programs requiring students to learn computer language and interact with the computer.
3. Tutorial type programs with the computer functioning as a lecturer or information presenter.

The Microcomputer as an Instructional Device

Advantages

Walker³⁴ lists seven major means by which the use of computers may improve or aid in the instruction of reading:

1. More active learning.
2. More varied sensory and conceptual modes may be utilized.
3. Learning with less mental drudgery.

4. Learning at a speed most propitious for the student.
5. Individually prescribed learning.
6. More independent learning possible.
7. Aids in concept development and abstract thinking.³⁴

The multimodal involvement of children in the learning process has long been a stated goal of educators. It would seem that the microcomputer combined with tape players and videotapes makes this a distinct possibility. The appeal of the computer with its television monitor and typewriter-like keyboard seems to remove the stereotype of learning being a distasteful uninteresting task. The computer monitor and keyboard associated with TV games, seems to have more appeal by association, than many standard teaching and learning devices long in use.

The use of the microcomputer also makes possible the goal of individualizing instruction and permitting students to proceed as rapidly or slowly as they can or want to. Some programs are even set up to assess the student's progress, at any given time, present the next lesson or concept, assess the student's progress on this day's work, combine it with what he has done previously, and either branch to a lower developmental level if needed or proceed to the next lesson. There is also a cumulative running record of this student's work preserved for the teacher to access as needed. It would seem that the microcomputer is ideally designed to help develop IEP's.²⁴

Individual Independent Study and Learning would seem to be fostered by use of the computer and could free the teacher to engage in more individual conference type instruction. It should also help to increase pupil time on task and lead to better and faster learning.¹⁷

Finally, the utilization of computers as an aid to the learning and use of abstractions is a definite advantage. For, as Davis⁴ notes, the use of computers in conjunction with other audio and visual devices has made possible the mastery of concepts and the ability to manipulate these abstractly at an intuitive level of understanding.¹¹ This is a definite advantage which may be peculiar to the use of the computer as an instructional device.^{4,34}

Limitations

The use of the microcomputer is not an unmixed blessing. Most students respond positively to the notion of using a computer as a learning device but not all students profit from this experience.

Walker³⁴ also lists seven limitations associated with the use of microcomputers for instructional purposes:

1. The computer is best used as a supplement to good instruction, not a substitute for it.
2. Microcomputers are hard to use and to learn to use as an instructional device.
3. Different computers and programs require different procedures. Many programs are not compatible from one computer to another. Hence, there is rapid change occurring without standardization.

4. Good programs are scarce and teachers experienced in using them scarcer.
5. There is a general lack of knowledge regarding the use of computers for educational purposes.
6. Computers can handle rule-based procedures once the system of rules and procedures has been worked out but they, as yet, cannot make judgmental decisions of unformalized theoretical constructs and materials.
7. Computers cannot and will not solve current school problems.

These seven formulations reveal some of the major problems associated with the use of computers in schools. The computer is indeed a fine instructional tool that lends itself admirably as a device to provide practice and set learned concepts in memory. The computer, in and of itself, cannot and will not teach anything. But, if loaded with a program well conceived, designed, and sequenced, a computer can be used to give practice in and present problems that require the use of concepts, facts, and skills previously presented.

Students and teachers also have to learn the procedures to use the computer as a learning and an instructional device. The student must understand the concept of a sentence before he can learn to use the computer to build them. They also must understand the basic principles of number before using the computer as a calculator in solving arithmetical problems. But this is also true of using a calculator.

Walker³⁴ points out that several three-hour courses are usually necessary to prepare teachers to effectively use the

computer as a teaching device. This usage also usually requires the teacher to be able to do some programming. The necessity for this arises because of the need for existing programs to be modified to fit individual pupil needs and others written to fill new educational problems as they arise.

The lack of standardization is particularly vexing. After you have learned to use the TRS 80 and then go to an Apple, it is necessary to modify your *modus operandi* to fit the other machine. This is also necessary when shifting from one of these to an IBM or an Atari or a Commodore Pet. Programs also are often not compatible from one computer to another and require varying amounts of modification before use on another brand of computer.

Possible Physical, Social, and Emotional Hazards

Getman¹¹ poses some interesting problems associated with computer usage such as the problem of development of eye-hand coordination in learning to write. If young school beginners spend too much time at the computer keyboard they may have difficulty developing the necessary eye-hand coordination in learning to write. Eye-hand coordination is also considered an aid in learning to read except for those children who have a serious problem developing eye-hand coordination. The development of small muscle control necessary for mastery of handwriting requires this skill and time spent at a computer keyboard does not foster its development.

The use of the computer also necessitates movement of eye

fixation from keyboard to monitor screen and back in a more or less continuous fashion. This process poses a more difficult visual task than trying to copy from material on the student's desk. Getman¹¹ notes that behavioral optometrists have found that 15 to 40 percent of primary age children do not have a level of visual skills necessary for them to perform the usual classroom tasks. Since the computer screen is much more demanding and the hands are busy on the keyboard, they cannot be used to help guide the eye while reading what is on the screen. This causes considerable strain and may also lessen the attention span of the child.¹¹

He also points out that adults working day-after-day at computer terminals often suffer morale problems due to frustrations associated with computer tasks.¹¹ An article in the November 28, 1983 Chicago Tribune by Carol Kleiman¹⁶ highlights the fact that a union contract at Boston University provides for special consideration for secretaries who have to work daily at a video display terminal. Many medical and psychological problems are claimed to be caused by extended use of a video display terminal but there is still some question as to the veracity of these alleged ensuing problems.

The use of the microcomputer is discussed from another point of view by Deborah McCabe.²³ She makes the point that the computer utilizes the auditory, visual, and kinesthetic sense modalities. The great challenge will be to program materials so that they access the dominant modality of each

learner. Software that is available at this time stresses the visual and neglects the auditory and kinesthetic.

The very cogent point is also made that educators are primarily left-brained while programmers tend to be right-brained.²³ If the effort to bring these two types of people together to plan and program software for the computer is successful, then some excellent material may be forthcoming. However, the present practice of programmers working independently of educators may lead to the continued problem of educators rejecting software publications as being cluttered visually and conceptually, lacking clear goals and objectives, unclear instructions, and poor sequence.

In conclusion may we present the results of a computer survey as found in Academic Therapy⁸ listing 18 pros and cons of computer usage.

Two overall recommendations bear emphasis.

1. Accept software into approved state textbook lists.
2. Form computer assistance research teams to spend a full year learning about microcomputers and software.

Pros of using microcomputers

1. Highly motivating and encouraging.
2. Cuts down paperwork-especially good for IEP's.
3. Helps prepare students for a computerized world.
4. Knowledge of computers may lead to vocational goals.
5. Fosters independent study

6. Gives immediate feedback to students.
7. Encourages individualization.
8. Non-threatening.
9. Self-pacing.
10. Useful for all age and ability groups.
11. Games can be used for instruction and rewards.
12. Students get a break from teacher instruction.
13. Encourages student creativity.
14. Removes fear of failure.
15. Useful as a behavioral control device.
16. Helps L.D. students savor success.
17. Useful in developing critical thinking and problem solving.
18. Helps develop independence and responsibility.

Cons of the use of microcomputers

1. Too expensive-purchase and maintain.
2. Requires excessive time for teachers to learn to operate.
3. Computer accessibility and time-sharing.
4. Incompatibility of software programs.
5. Poor software and price.
6. Forced multiple choice format requiring no writing.
7. Develops a right-brained society instead of a language-oriented society.
8. Cost is often the major factor in purchase rather than program.
9. Letters on the screen too small.

10. Limits the interaction between teachers and students.
11. A frustrating experience for students with visual memory for symbols and punctuation.
12. Material presented only in capital letters with little or no punctuation.
13. Can become only a plaything.
14. Machine may lose its appeal if used too often.
15. May be used as an excuse to not teach a child.
16. No opportunity for informal diagnostic evaluation.
17. Inappropriate if basic fundamentals of a subject are unknown.
18. May stress a passive type of learning rather than an active one⁸

Reference

1. Bernstein, Harriet T. "The Information Society: Biting the Hand That Feeds You," Phi Delta Kappan, 65:108-109, October, 1983.
2. Blanchard, Jay S. "Computer-Assisted Instruction in Today's Reading Classrooms," Journal of Reading, 430-434, February, 1980.
3. Burke, Robert. CAI Sourcebook, Prentice-Hall, Inc., Englewood Cliffs, N.J., 1982.
4. Davis, Philip J., and Reuben Hersh. The Mathematical Experience, Houghton Mifflin, Boston, 1981, p. 403.
5. DeBonis, Donna M., Joseph, David, and Janet Prezioso. "Education's New Alphabet: Alphanumeric, Byte, Chip," Academic Therapy, 18:133-140, November, 1982.
6. Decker, Walter F. "Reflections on the Educational Potential and Limitations of Microcomputers," Phi Delta Kappan, 65:103-107, October, 1983.
7. Editorial Staff. "Microcomputer Notebook," Academic Therapy, 18:163-170, November, 1982.
8. Editorial Staff. "Pros and Cons of the Microcomputer-- A Survey," Academic Therapy, 18:535-538, May, 1983.
9. Estes, Thomas H. "A Commentary on Reading and Understanding: Teaching from a Perspective of Artificial Intelligence," The Reading Teacher, 36:484-490, February, 1983.

10. Evans, William H., and Thomas M. Stritch. "The Video-Game Syndrome," Academic Therapy, 18:533-534, May, 1983.
11. Getman, G.M. "Computers in the Classroom: Bane and Boon?," Academic Therapy, 18:517-524, May, 1983.
12. Hennings, Dorothy G. "Words Processed Here: Write with Your Computer," Phi Delta Kappan, 65:122-126, October, 1983.
13. Holmes, Glyn. "Computer-Assisted Instruction: A Discussion of Some Issues for Would-Be Implementors," Educational Technology, 7-12, September, 1982.
14. Hunter, Beverly, Donald Dearborn, and Bruce Snyder. "Computer Literacy in the K-8 Curriculum," Phi Delta Kappan, 65:115-118, October, 1983.
15. Judd, Walter. "A Teacher's Place in the Computer Curriculum," Phi Delta Kappan, 65:120-122, October, 1983.
16. Kleiman, Carol. "Contract Addresses Fear about VDT's," Chicago Tribune, November 28, 1983, Section 3, p. 3.
17. Kulik, James A., Robert L. Bangert, and Gorge W. Williams. "Effects of Computer-Based Teaching on Secondary School Students," Journal of Educational Psychology, 19-26, February, 1983.
18. Littlefield, Paul. "What the Ads Don't Tell You," Academic Therapy, 18:525-528, May, 1983.
19. Major, Kenneth. "Computer Assisted Instruction and Reading; How, What, When, and Where?," Educational Technology, 23-26, September, 1973.

20. Mason, George E., and Jay S. Blanchard. Computer Application in Reading, International Reading Association, Inc., 800 Barksdale Road, Box 8129, Neward, Delaware 19714, 1979, pp. 18-22.
21. Mason, George E. "Computerized Reading Instruction: A Review," Educational Technology, 18-22, October, 1980.
22. Mason, George E. "The Computer in the Reading Clinic," The Reading Teacher, 36:504-507, February, 1983.
23. McCabe, Deborah. "Not What, But How Do Individuals Learn? A Microcomputer Challenge," Academic Teacher, 18:529-532, May, 1983.
24. Minick, Barbara A., and Beverly School. "The IEP Process- Can Computers Help," Academic Therapy, 18:141-148, November, 1982.
25. Moyles, Laura C., and Jeanne Newll. "Microcomputers in a Postsecondary Curriculum," Academic Therapy, 18:149-155, November, 1982.
26. Obertino, Priscilla. "The Plato Reading Project: An Overview," Educational Technology, 3-14, February, 1974.
27. O'Brien, Thomas C. "Five Essays on Computer in Education," Phi Delta Kappan, 65:110-112, October, 1983.
28. O'Donnell, Holly. "Beyond Computer Literacy," Journal of Reading, 27:78-80, October, 1983.
29. Railsback, Charles E. "Microcomputers: Solutions in Search of Problems," Phi Delta Kappan, 65:118-120, October, 1983.

30. Reece, Harriet F. "Computers, Learning Styles, and Instructional Materials--Are They Related?," Academic Therapy, 18:157-161, November, 1982.
31. Shane, Harold G. "The Silicon Age II: Living and Learning in an Information Epoch," Phi Delta Kappan, 65:126-126, October, 1983.
32. Snider, Robert G. "Terminal Time in the Classroom," Phi Delta Kappan, 65:113-115, October, 1983.
33. Suppes, Patrick. "The Future of Computers in Education," as found in Robert P. Taylor, ed., The Computer in the School: Tutor, Tool, Tutee, Teachers College Press, New York, 1980, pp. 248-261.
34. Walker, Noonjin, and Michael Biollot. "A Computerized Reading Level Analysis," Educational Technology, 47-49, January, 1979.
35. Wells, Bethany J., and D. Scott Bell. "A New Approach to Teaching Reading Comprehension: Using Cloze and Computer Assisted Instruction," Educational Technology, 49-51, March, 1980.